

CLAIMS

1. A portable multi-band communication device (1), comprising a power amplifier (216), a battery (270) for supplying power to the power amplifier, and a controller (240), the controller being arranged to control an output power level of the communication device by generating a digital control signal (DAC value) for the power amplifier, **characterized by**

the controller (240) being arranged to monitor the digital control signal (DAC value) and in response determine a consumption (ChargeConsumption, CurrentCount) of electric energy from the battery (270).

2. A portable multi-band communication device as in claim 1, further comprising a D/A (digital-to-analog) converter (218) operatively connected to the power amplifier (216), the D/A converter being arranged to receive, at an input thereof, the digital control signal (DAC value), convert the digital control signal into an analog control signal (Pwr Ctrl) and submit, at an output of the D/A converter, the analog control signal to the power amplifier.

3. A portable multi-band communication device as in claim 1 or 2, further comprising a memory (244) operatively connected to the controller (240), wherein the memory is adapted to store a set of predetermined consumption values (TxCurrent) associated with different values (00...n) of the digital control signal (DAC value).

4. A portable multi-band communication device as in claim 3, further comprising a radio transmitter (214), the operation of which is controlled through a control signal strobe-(TX str) submitted by the controller (240), wherein the controller is arranged to:

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- 10 detect the control signal strobe (TX str) to the radio transmitter,
- 15 determine a value (00...n) of the digital control signal (DAC value),
- 20 5 form an index (idx) from the determined value of the digital control signal,
- 25 use the index for reading one consumption value (TxCurrent[idx]) in the predetermined set (TxCurrent) from the memory (244), and
- 30 10 update an accumulated consumption value (CurrentCount) to reflect the consumption value thus read.
- 35 15 5. A portable multi-band communication device as in claim 3, further comprising a radio transmitter (214), the operation of which is controlled through a control signal strobe (TX str) submitted by the controller (240), the memory (244) having a set of counters (TxStrobe) for different values (00...n) of the digital control signal (DAC value), wherein the controller is arranged to:
- 40 20 detect the control signal strobe (TX str) to the radio transmitter,
- 45 25 determine a value (00...n) of the digital control signal (DAC value),
- 50 30 increment, in said set of counters, the counter that represents the determined value of the digital control signal, and
- 55 35 subsequently calculate the consumption (ChargeConsumption) of electric energy from the battery (270) from the contents of said set of counters (TxStrobe) and from the set of predetermined consumption values (TxCurrent).
- 60 40 6. A portable multi-band communication device as in any of claims 3, wherein the set of predetermined con-

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sumption values (TxCurrent) is represented by a polynomial function.

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5 ~~Claim~~ 7. A portable multi-band communication device as in ~~any preceding claim~~, the device further comprising a graphical display (6), wherein the controller (240) is arranged to calculate an estimated remaining battery capacity by subtracting the determined consumption (ChargeConsumption, CurrentCount) of electric energy from a previous value of remaining battery capacity, and wherein the controller is arranged to visually indicate the calculated estimated remaining battery capacity (13) on the graphical display.

15 ~~Claim~~ 8. A portable multi-band communication device as in ~~any preceding claim~~, wherein the device is a mobile telephone (1), such as a TDMA telephone, or a W-CDMA telephone.

20 ~~Claim~~ 9. A method of determining a charge consumption for a portable battery-powered communication device (1), said device comprising a radio transmitter (214), a power amplifier (216) operatively connected to the radio transmitter and a controller (240) operatively connected to the power amplifier, wherein an output power level of the radio transmitter is controlled by the power amplifier through a digital control signal (DAC value) from the controller, and wherein the radio transmitter is furthermore responsive to a control signal strobe (TX str.,
25 characterized by the steps of

30 storing a set of predetermined consumption values (TxCurrent) providing an association between different amounts of electric charge consumption and respective values of the digital control signal (DAC value),
35 detecting the control signal strobe (TX str.),

determining a value (00...n) of the digital control signal (DAC value),

selecting, from said set of predetermined consumption values (TxCurrent), a value which corresponds to the determined value (00...n) of the digital control signal (DAC value), and

updating an accumulated charge consumption value (CurrentCount) to reflect the selected value.

- 10 10. A method according to claim 9, applied to a mobile telephone (1).

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